ABSTRACT OF THE DISCLOSURE

A high-speed WPAN (Wireless Personal Area Network) system for extending a service area includes an optical fiber serving as a medium for transmitting data; a plurality of pico-nets each including a plurality of devices and a PNC (Pico-Net Coordinator) device for managing the devices; a plurality of two-way signal converters corresponding to the pico-nets, each of the signal converters adapted for converting an optical signal received from the optical fiber into an electrical signal to transmit the electrical signal to the pico-nets, and for converting an electrical signal received from each of the pico-nets into an optical signal to transmit the optical signal to the optical fiber. A plurality of connectors are attached to the optical fiber and the signal converters for transmitting signals input from the optical fiber and the signal converters bidirectionally. One of the PNC devices provided in the pico-nets allocates and manages timeslots for all the devices located in the plurality of pico-nets, and the plurality of pico-nets may be operated as a single logical unit.